

**Notice of Allowability**

Application No.

10/027,742

Examiner

Rip A. Lee

Applicant(s)

MEHTA ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to January 26, 2004.
2. ☒ The allowed claim(s) is/are 1, 3-9 and 14-20.
3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### **DETAILED ACTION**

This office action follows a response filed on January 26, 2004. Applicants have canceled claims 10-13.

#### ***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance: Claims 1, 3-9, 14-20 are allowed over the closest references, U.S. Patent No. 6,583,209 to Mehta *et al.*, U.S. Patent No. 5,717,000 to Karande *et al.*, U.S. Patent No. 6,521,690 to Ross *et al.*, and Wang *et al.* (*Polymer* 2001).

The present invention relates to an ethylene polymer composite comprising:

- (a) 76-99.25 wt % of an ethylene homopolymer or ethylene/C<sub>3-8</sub>  $\alpha$ -olefin copolymer,
  - (b) 0.5-12 wt % of organically modified clay consisting of a smectite clay that has been ion-exchanged and intercalated with a dimethyl dehydrogenated tallow quaternary ammonium ion, and
  - (c) 0.25-12 wt % of an ethylene polymer compatibilizing agent selected from the group consisting of ethylene-vinyl carboxylate copolymers and polymers of ethylene having from 0.1 to 9 wt % ethylenically unsaturated carboxylic acid or derivative monomer copolymerized or grafted;
- the weight ratio of (b) to (c) ranging from 1:5 to 1:0.1.

U.S. Patent No. 6,583,209 to Mehta *et al.* teaches a thermoplastic resin composite comprised of:

(a) 76-99 wt % of a propylene copolymer base resin (random propylene-ethylene copolymer or two-phase propylene homopolymer dispersed in propylene-ethylene copolymer),

(b) 0.5-12 wt % of organically modified clay consisting of a smectite clay that has been ion-exchanged and intercalated with quaternary ammonium ion  $R_n(CH_3)_mNCl$ , wherein R is a hydrogenated tallow moiety, n is 1-4 and m is 0-3, and

(c) 0.5-12 wt % of propylene copolymer compatibilizing agent obtained by grafting 0.2-2.5 wt % maleic anhydride and 97.5-99.8 wt % of propylene-ethylene copolymer;

the weight ratio of (b) to (c) ranging from 1:5 to 1:0.1.

Arguably, the propylene-ethylene copolymer (a) of Mehta *et al.* may be construed generically as "ethylene/C<sub>3-8</sub>  $\alpha$ -olefin copolymer" of the present claims, but clearly, the invention of the prior art is drawn to compositions in which propylene is the base resin. This can be gleaned from the claim language (note that compatibilizer (c) is a propylene copolymer compatibilizing agent) and from the teachings of the patent. In contrast, the compositions of the present invention are based on polyethylene.

Karande *et al.* teaches a composition comprising organophilic clay dispersed in an olefinic polymer having polar functionality. The organophilic clay, Claytone HY, is montmorillonite intercalated with dimethyl dihydrogenated tallow ammonium ions. The olefinic polymer is ethylene-vinyl acetate copolymer, such as Escorene polymers, which contain about 6-

Art Unit: 1713

18 wt % of vinyl acetate units. The compositions shown in the examples contain about 4.5 wt % of clay material. The prior art does not teach the composition of the present claims because there is no ethylene homopolymer or ethylene/C<sub>3-8</sub>  $\alpha$ -olefin copolymer component.

Ross *et al.* teaches a composition comprising up to 40 wt % of smectite clay which has been ion exchanged with a quaternary ammonium compound such as 2M2HT (dimethyl dihydrogenated tallow ammonium) and one or more thermoplastic polymers. The thermoplastic polymer is selected from polyolefins and ethylene-vinyl acetate copolymers, *inter alia*. The reference does not teach the specific combination of polyethylene and ethylene-based compatibilizing agent, as recited in the present claims. The skilled artisan would not have found it obvious to arrive at the present invention based on the disclosure of Ross *et al.*

Wang *et al.* teaches polyethylene/clay nanocomposite materials containing LLDPE (ethylene/ $\alpha$ -olefin copolymer) base resin, organophilic clay, and maleic anhydride modified polyethylene (labeled PEMA) as compatibilizing agent. Montmorillonite clay is modified with dimethyl dihydrogenated tallow ammonium ions. Tallow contains about 65 % C<sub>18</sub> chains. PEMA contains 0.85 % grafted maleic anhydride. The experiments corresponding to Figure 6 relate disclose a composition containing LLDPE, 5 wt % PEMA, and 5 wt % clay containing dimethyl dihydrogenated tallow ammonium ion. The invention of the prior art is essentially the same as that of the present claims, however, Applicants have shown *via* declaration under 37 § C.F.R. 1.131 that the instant invention was conceived and was reduced to practice by Applicants prior to the earliest date of appearance of Wang *et al.*

Another aspect of the invention is a concentrate comprising 20-70 wt % of carrier resin selected from ethylene homopolymer and copolymers of ethylene with C<sub>3-8</sub>  $\alpha$ -olefin, vinyl C<sub>2-4</sub> carboxylate, or C<sub>1-4</sub> alkyl (meth)acrylate comonomers, and 30-80 wt % of additives comprising an organically modified clay consisting of smectite clay that has been ion-exchanged and intercalated with a dimethyl dehydrogenated tallow quaternary ammonium ion. In another embodiment, the concentrate carrier resin is ethylene-vinyl acetate copolymer.


None of the cited references teaches concentrate compositions of the present invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

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April 29, 2004

  
DAVID W. WU  
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